

(7.6 & 7.7) Solving Problems using Right Triangles and Trigonometry

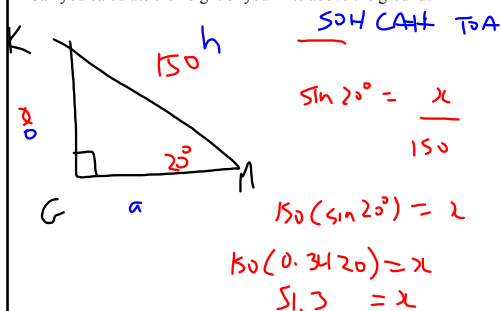
You're out in a field flying your kite. You have just let out all 150 m of your kite string. You estimate that the kite is at an angle of elevation from you of about 20° . Can you calculate the height of your kite above the ground?

The kite is 51.3 m above the ground.

Jun 4-11:02 AM

(7.6 & 7.7) Solving Problems using Right Triangles and Trigonometry

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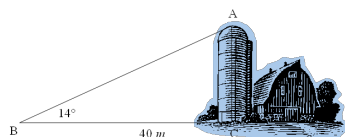


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Problem 1:

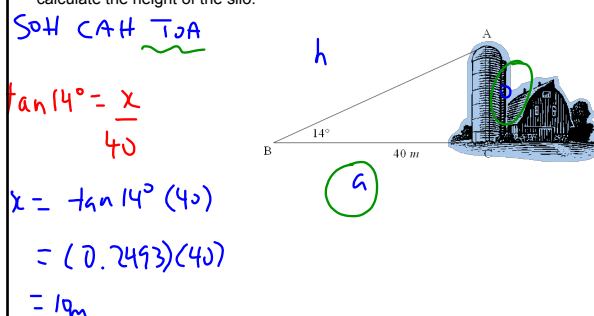
While walking to school you pass a barn with a silo. Looking up to the top of the silo you estimate the angle of elevation to the top of the silo to be about 14° . You continue walking and find that you were around 40 m from the silo. Using this information and your knowledge of trigonometric ratios calculate the height of the silo.



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Problem 1:

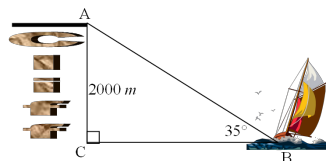
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Problem 2:

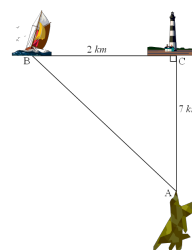
A sailboat is approaching a cliff. The angle of elevation from the sailboat to the top of the cliff is 35° . The height of the cliff is known to be about 2000 m. How far is the sailboat away from the base of the cliff?



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Problem 3:

A sailboat that is 2 km due west of a lighthouse sends a signal to the lighthouse that it is in distress. The lighthouse quickly signals a rescue plane that is 7 km due south of the lighthouse. What heading from due north should the plane take in order to intercept the troubled sailboat?

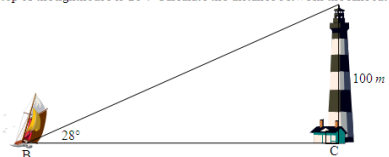


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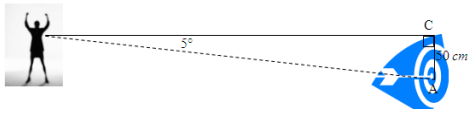
(7.6 & 7.7) Solving Problems and Trigonometry Worksheet

Round \angle 's to whole degrees. Length answers should be rounded to 1 decimal place and include units.

1. The top of a lighthouse is 100 m above sea level. The angle of elevation from the deck of the sailboat to the top of the lighthouse is 28° . Calculate the distance between the sailboat and the lighthouse.



2. An archer shoots and gets a bulls-eye on the target. From the archer's eye level the angle of depression to the bulls-eye is 5° . The arrow is in the target 50 cm below the archer's eye level. Calculate the distance the arrow flew to hit the target (the dotted line).



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3. Two islands A and B are 3 km apart. A third island C is located due south of A and due west of B. From island B the angle between islands A and C is 33° . Calculate how far island C is from island A and from island B.

4. The foot (bottom) of a ladder is placed 1.5 m from a wall. The ladder makes a 70° angle with the level ground. Find the length of the ladder. (Round to one decimal place.)

5. A tow truck raises the front end of a car 0.75 m above the ground. If the car is 2.8 m long what angle does the car make with the ground?

6. A construction engineer determines that a straight road must rise vertically 45 m over a 250 m distance measured along the surface of the road (this represents the hypotenuse of the right triangle). Calculate the angle of elevation of the road.

Answers:

1. 188.1 m 2. 573.7 cm 3. Distance A to C: 1.6 km Distance B to C: 2.5 km
4. 4.4 m 5. 16° 6. 10°

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